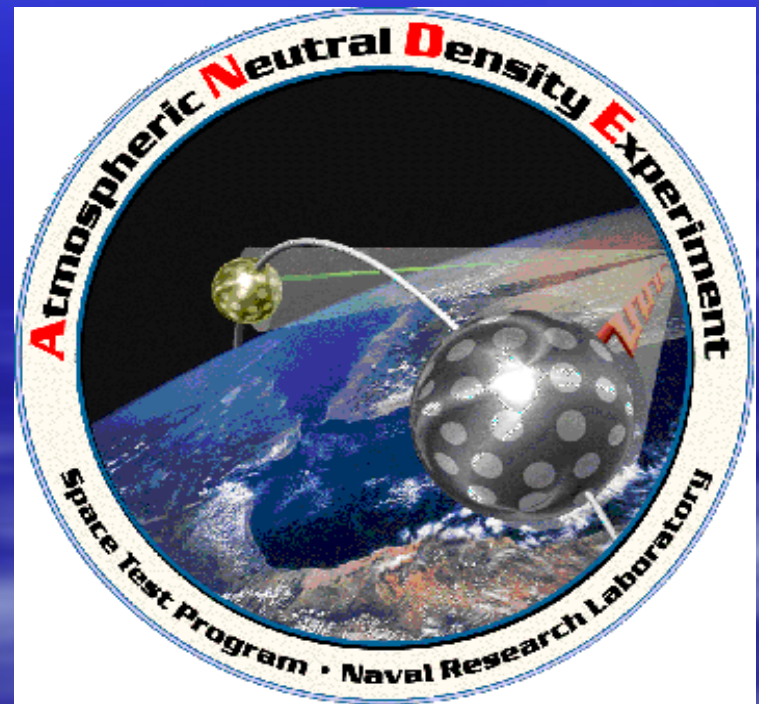


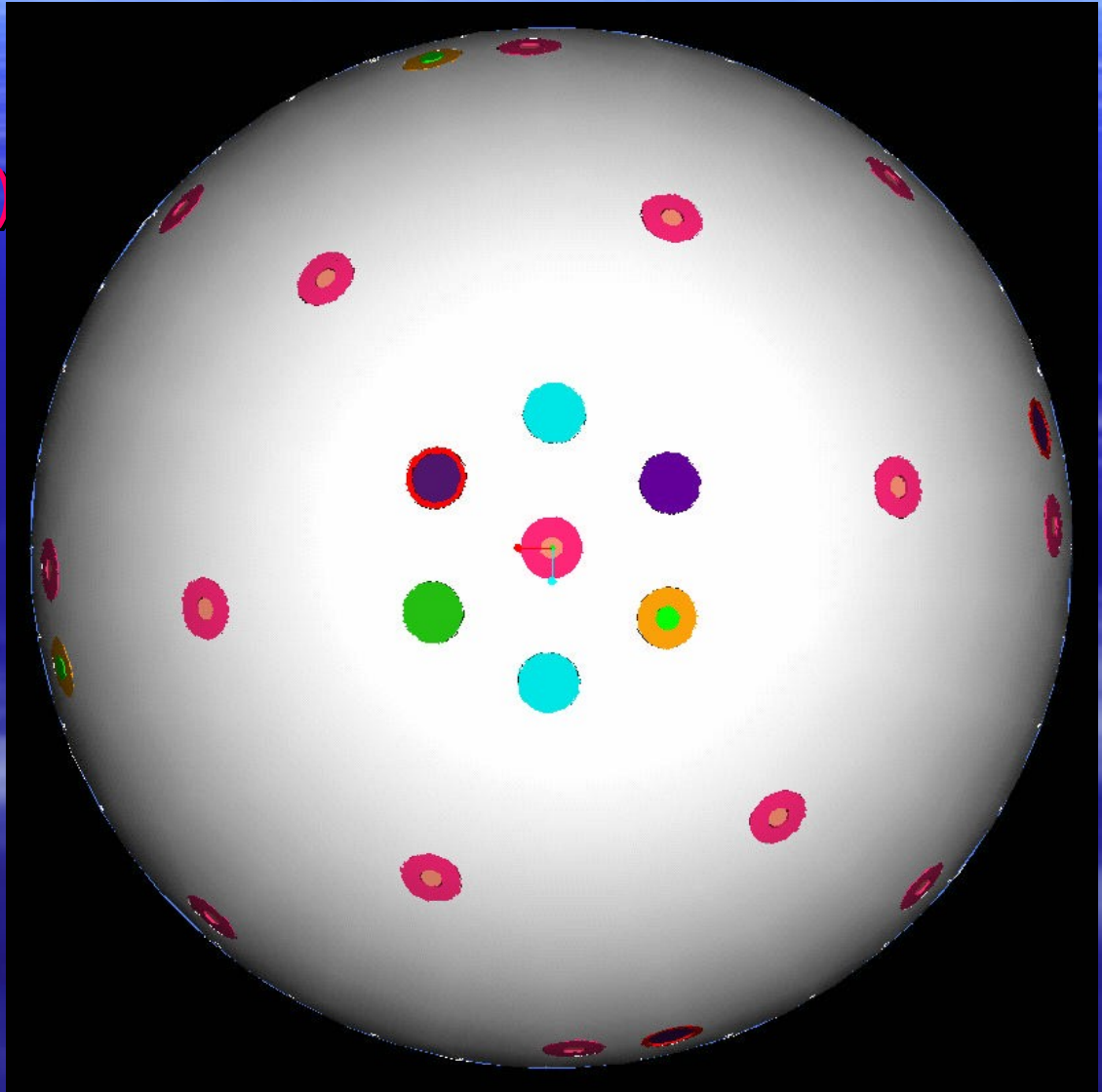
# ANDE

- Team Leader:  
Benjamin Aaron
- Comms:  
Ernesto Villalba
- Power: Crispina  
Weissenberg



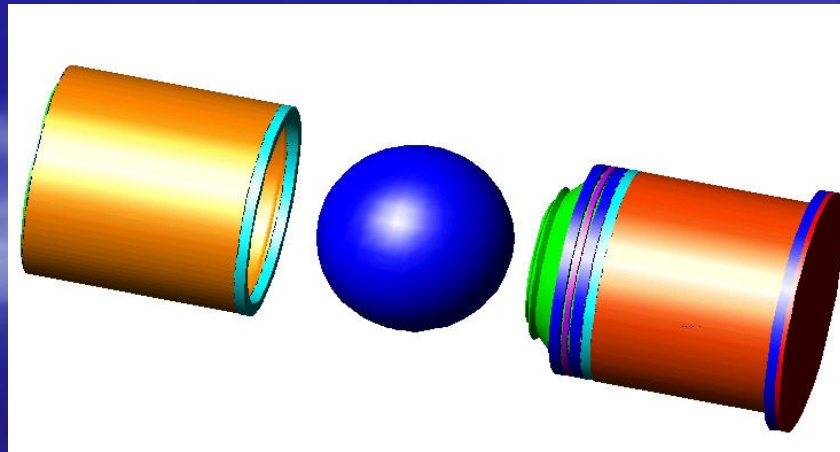
# External Component Layout

- Retro-Reflector (30)
- Photovoltaic (6)
- Laser Diode (6)
- GSE Interface (1)
- RF Inhibit (1)
  - Ejection axis
- Lift Point (2)



# CAPE Ejection System

- Canister for All Payload Ejection (CAPE)
- Will be deployed from Space Shuttle
- Designed to fit payload requirements for Space Shuttle.



# USNA Mission Statement

- To construct a communications system able to transmit telemetry data and provide communications support in the amateur satellite service, for at least one year, via a zero drag antenna for the ANDE risk reduction flight satellite.

# USNA Mission Requirements

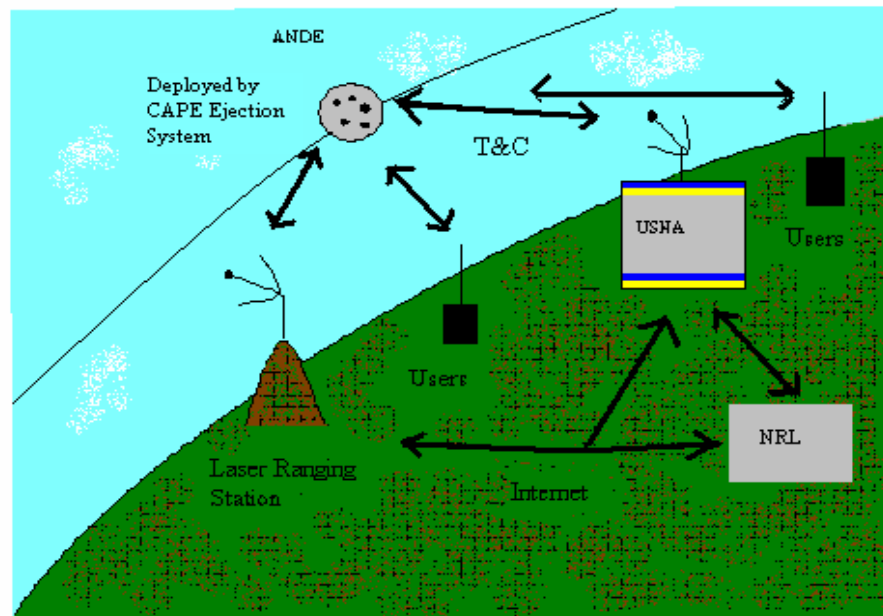
- 1. Mechanical Configuration (Spherical)
- 2. Transmit Telemetry Data
- 3. Command and Control
- 4. Communications Transponder in Amateur Satellite Service
- 5. Power System

# USNA Spring 2004 Schedule

<u>Date</u>	<u>Event</u>	
JAN 06	New team member selection and orientation	<b>COMPLETE</b>
JAN 30	Mechanical Review with NRL	<b>COMPLETE</b>
MAR 26	Complete Prototype and Testing	<b>COMPLETE</b>
APR 2	Complete Lithium Battery Vacuum Testing	<b>COMPLETE</b>
APR 14	Begin Flight Battery Board Assembly	
APR 21	Begin Flight Interface Board Assembly	
APR 26	System Progress Report Presentation	
APR 28	Test Operations	
To be completed by MAY 2004:		
Complete and Deliver Hardware to NRL		

# Mission Architecture

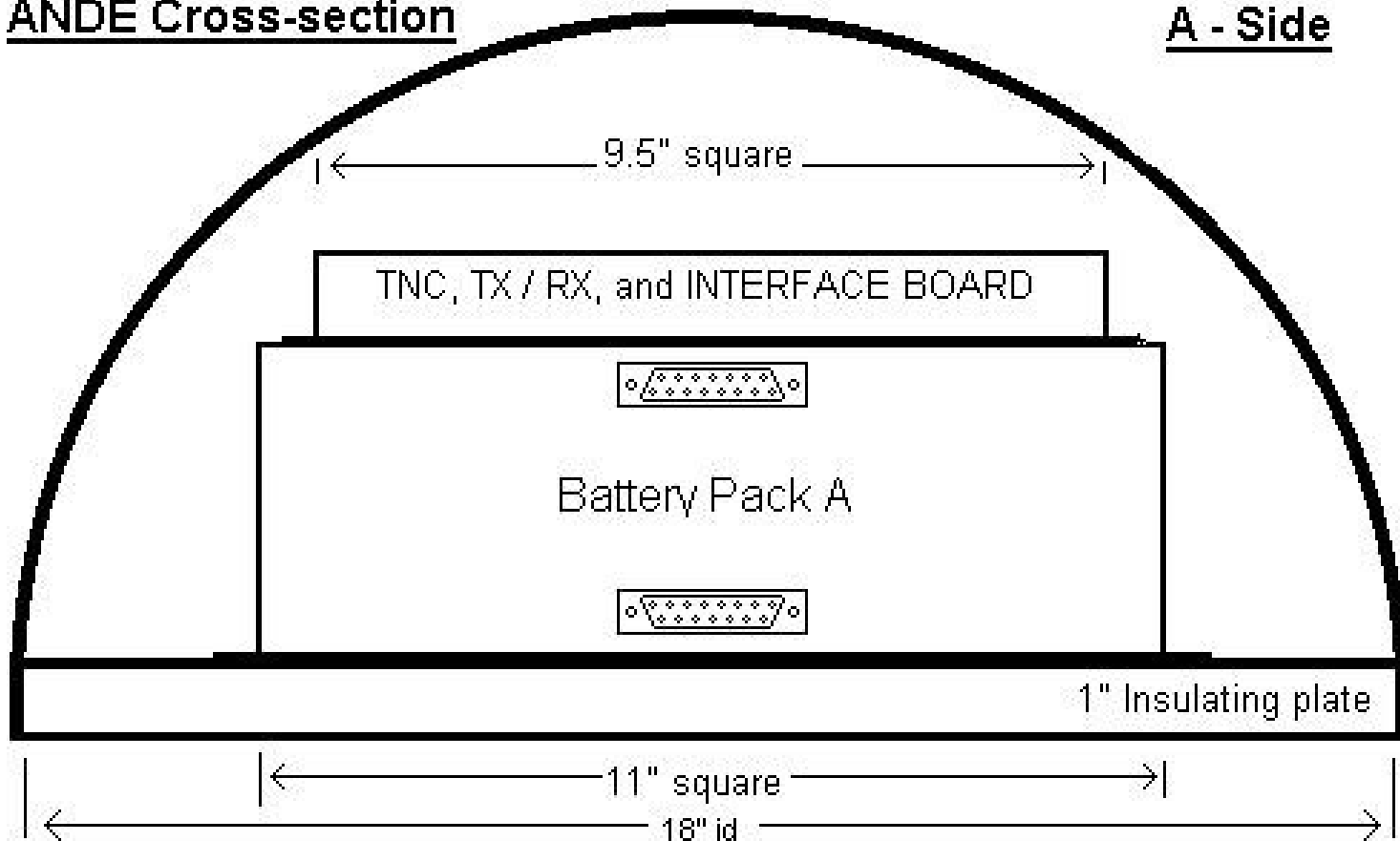
Mission Architecture



# Basic Schematic of ANDE

ANDE Cross-section

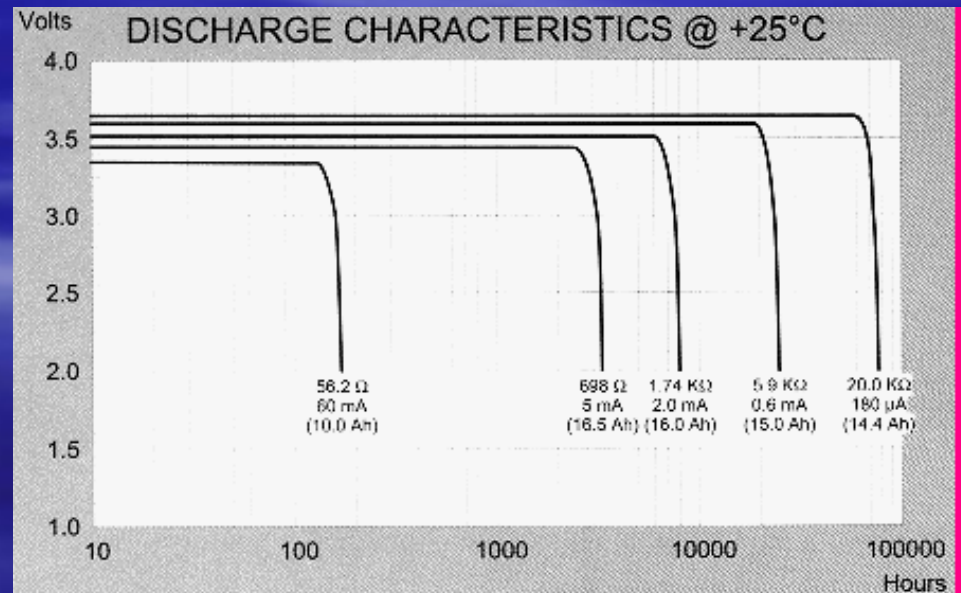
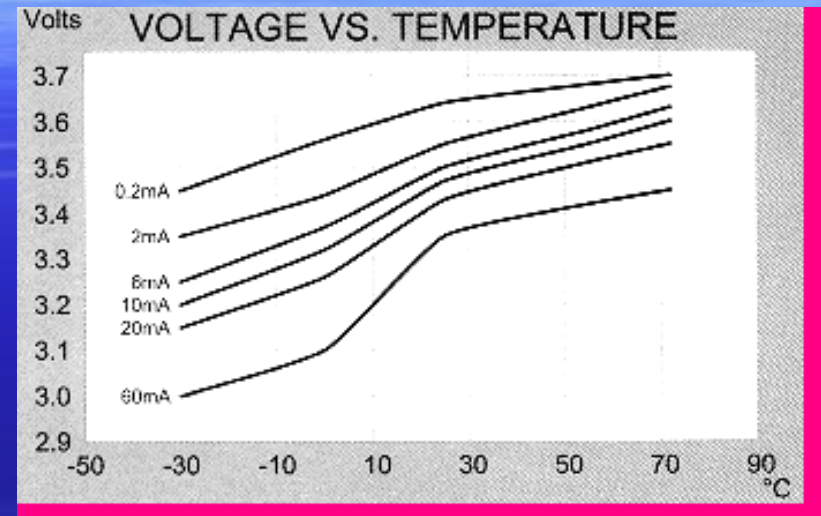
A - Side



As of 16 October decision has been made to use only 2 battery packs per side

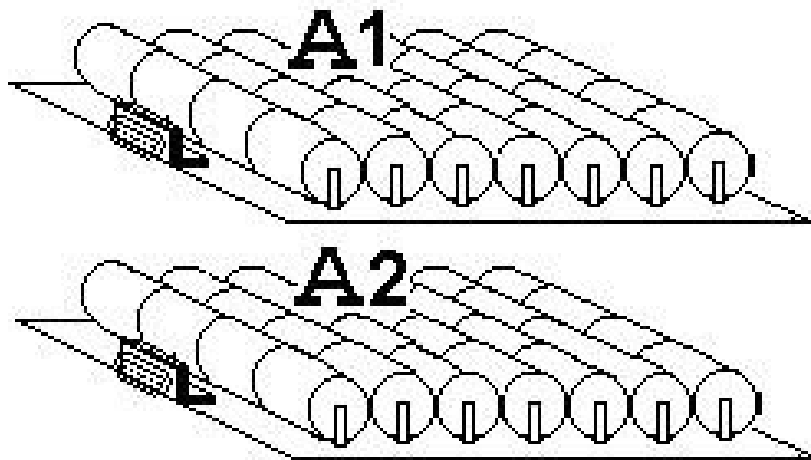
# Power System

- Battery Selection
  - Tadiran TL-5930 D-size Lithium Thionyl Chloride ( $\text{Li/SOCl}_2$ ) primary
    - 19 Ah capacity
    - 5 ma nominal discharge
    - Rated temperature range -55 to +85C
    - Designed for harsh environments
    - Bobbin construction



# Battery Board Layout

Each PCB is 11"x11"x1.75"



## ANDE Battery

(TADIRAN TL-5930)

**Capacity:** 7450 WHrs

**Life:** 1.5 Years

**Mass:** 12 Kg

**Volume:** 7683 cu cm

112 cells in 4 packs of  
28 cells wired as 7  
strings of 4 cells each.

Total is 28 strings

Half the batteries  
in each half of ANDE

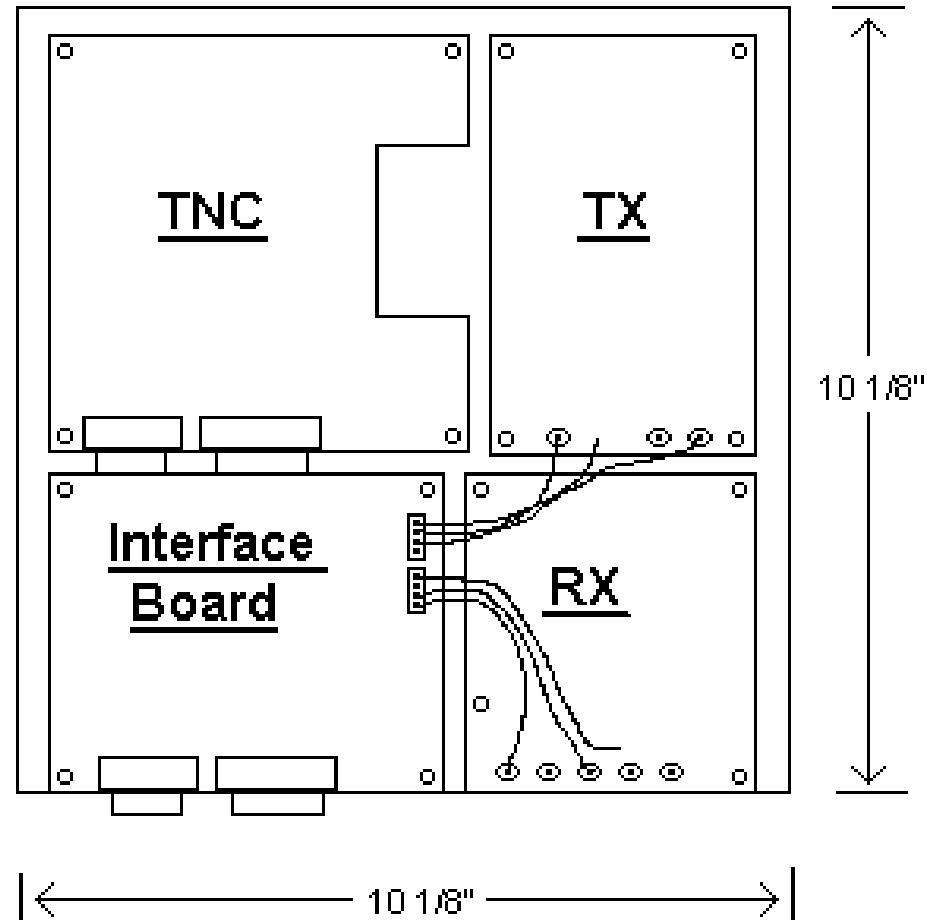
As of 16 October decision has been made to use only 2 battery packs per side

13 Nov 2002

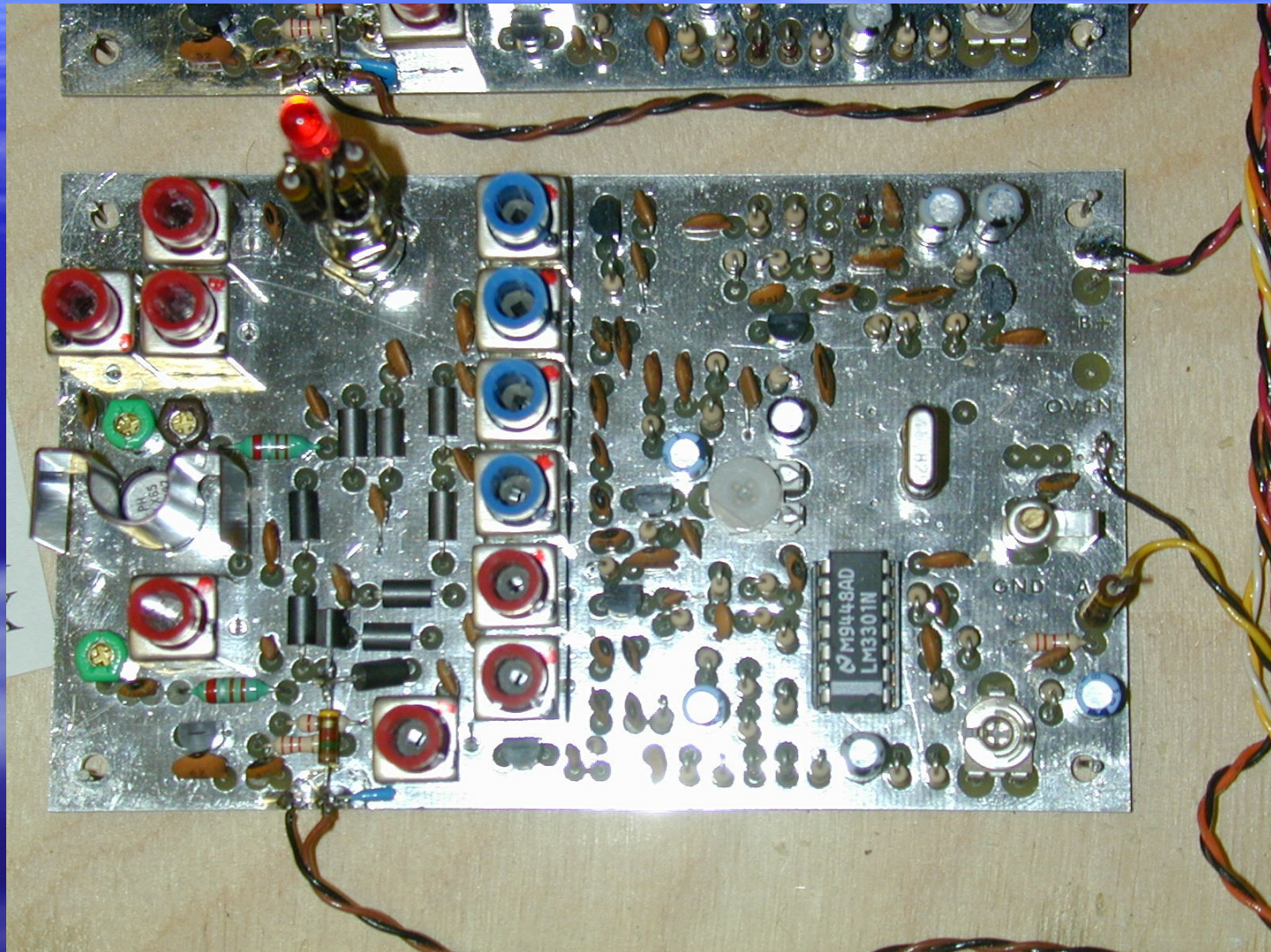
# Communications Tray Layout

## COMMUNICATIONS MODULE

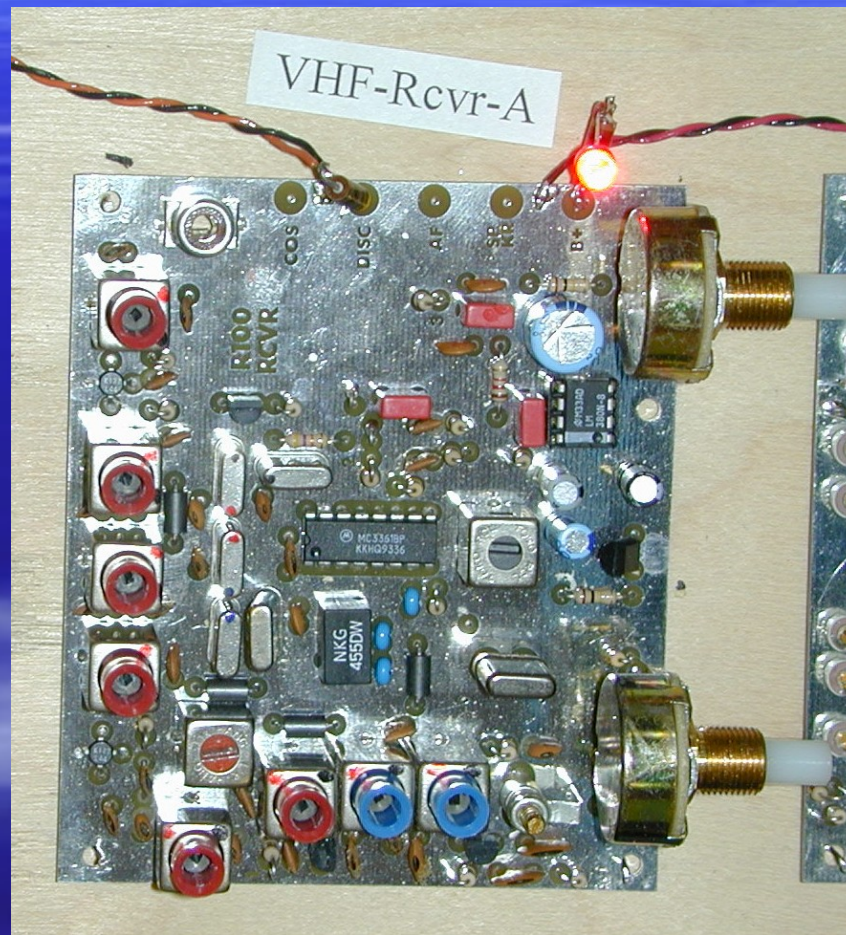
The 10 1/8" square comms tray allows for the interface board to be internal which helps reduce external interconnects in the wiring harness.



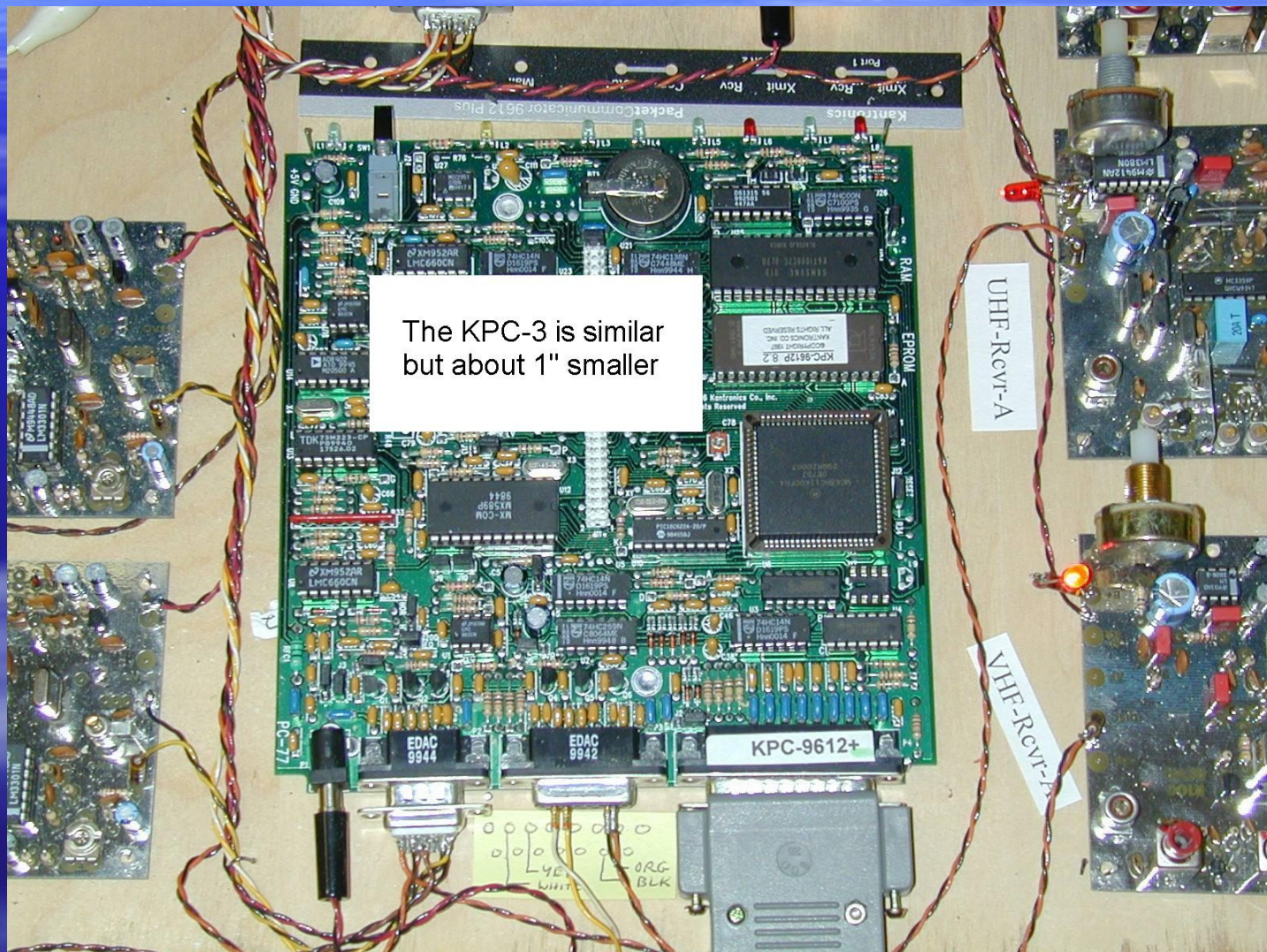
# VHF Transmitter



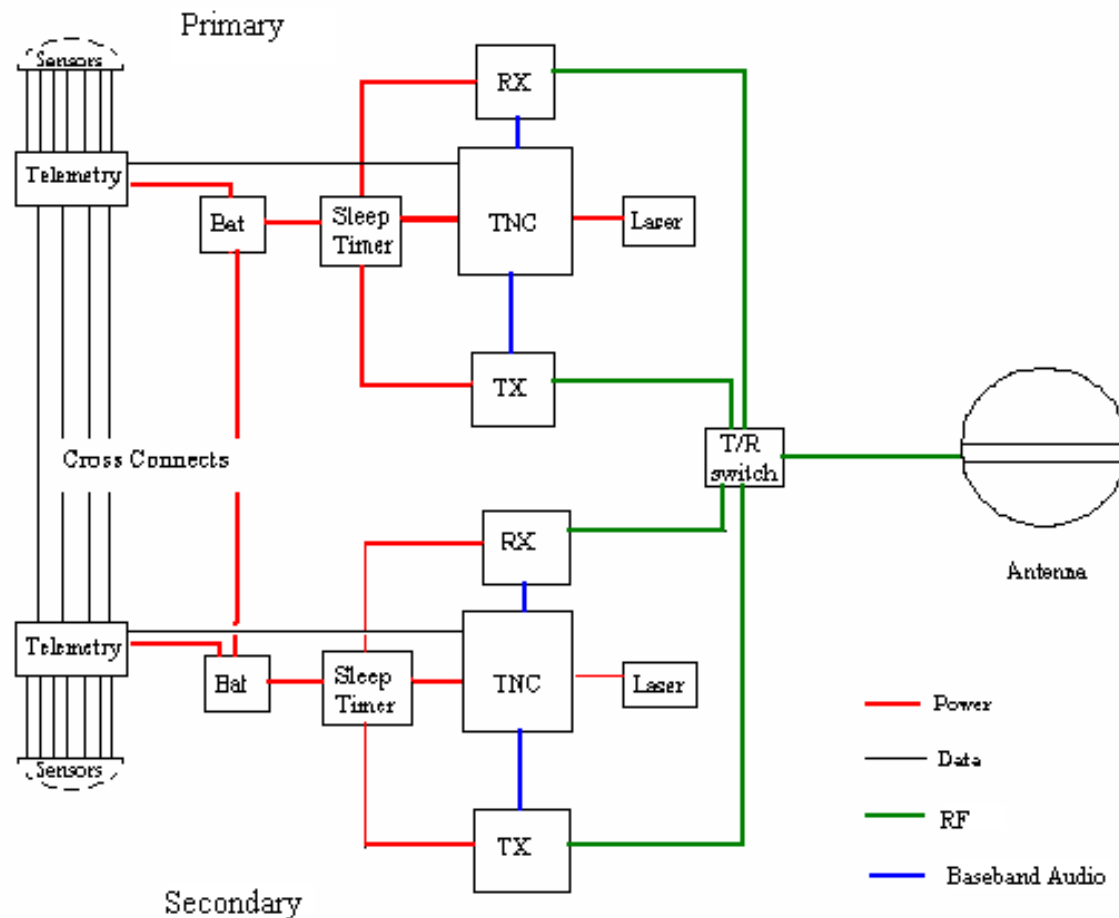
# VHF Receiver



# Terminal Node Controller



# ANDE Block Diagram



# Demonstration Sequence

- Use ping commands to wake ANDE
- Observe 40 seconds of telemetry
- Prove sensors work
- Log on
- Turn on the LEDs
- Observe temperature rise on lasers
- Fail each battery
- Log off